PROGRAM IMPLEMENTATION PLAN
for
PRECISION RUNWAY MONITOR
CIP S-01
Site Implementation (Post ISD)

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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

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DOCUMENT CHANGE NOTICE

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This notice informs recipients that the standard identified by the number (and revision letter) shown in block 4 has been changed. The pages changed by this DCN (being those furnished herewith) carry the same date as the DCN. The page numbers and dates listed below in the summary of changed pages, combined with non-listed pages of the original issue of the revision shown in block 4, constitute the current version of this specification.

13. DCN No.	14. Pages changed	S*	A/D*	15. Date

*S = Indicates Supersedes Earlier Pages *A = Indicates Added Page *D = Indicates Deleted Page

PRODUCT IMPLEMENTATION ASSESSMENT

The Product Implementation Plan (PIP) provides information to help assess the implementability of new system or service.

Your feedback is important to making appropriate adjustments to implementation strategies and plans

Please use this PIP to support your evaluation of the planned product implementation. Send your feedback to:

__ Khalil Kodsi_____, Associate Product Lead for NAS Implementation (APLNI), ANS-700.

Requests for additional product information may also be directed to the APLNI. Your input and requests will be promptly addressed.

FOREWORD

This Program Implementation Plan (PIP) provides management guidance and technical information to all levels of the FAA involved in the implementation of the Precision Runway Monitor (PRM).

This document was prepared using a streamline PIP format. Mature documentation exists for the PRM and information related to the eleven essential elements of implementation not covered in this PIP may be found in these documents. This PIP contains only relevant implementation information and attempts to exclude information that is easily accessible in other documents.

This PIP is a vehicle for the exchange of information between the field and headquarters; and provides an opportunity for regions. SMOs, and site personnel to participate in the PRM implementation process. Readers are encouraged to provide any comments that u-ill serve to improve this document.

Gene Wong, AND-450
Product Lead, PRM

Jerry Trenholm, ANS-700
Manager, NAS Transition and Integration Division

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1.0 GENERAL

1.1 Purpose and Scope of Document

This PIP presents overall guidance and summarizes requirements for the implementation of the Precision Runway Monitor (PRM). It outlines implementation procedures and identifies responsibilities governing the activities of specified organizations. A Generic Site Implementation Plan (GSIP) has been developed to assist regional and site personnel with the development of site-specific implementation plans and is attached as Appendix B.

Although the PIP is directed primarily to field use, it is applicable to all activities in FAA with responsibility for implementing the PRM program. Information contained in the PIP reflects the status and planning as of the publication date.

Since the PIP attempts to exclude information found in other references, readers are advised to refer to other documents developed by the Product Office for their specific functional areas of interests. Some of the principal PRM documents include: The Specification, Contract, Facility Reference Data File, General Maintenance Handbook for AF, Radiation and Health Hazards and Protection, Lightning Protection, Grounding, Bonding and Shielding Requirements for Equipment, and the PRM TOR Handbooks for each site.

1.2 Document Revision

The PIP will be updated as major events develop or changes occur. Revisions will be made by the Associate Product Lead for NAS Implementation/Implementation Support Specialist (APLNI/ISS), in coordination with the Product Lead for PRM, AND-450. The next revision to the PIP will be published within 60 days of ORD at St. Louis.

1.3 Definition of Terms

Acronyms are identified in Appendix A. Definitions of terms are attached in Appendix C.

1.4 Issues Identification, Tracking, and Resolution

Issues and risks associated with the implementation and sustainment of PRM are addressed in Section 7.0, Status Assessment. This section also identifies any missing or incomplete information, shows potential impacts on site implementation; and addresses

plans and/or solutions to problems. These issues will become agenda items at the monthly PRM telecons and will also be addressed in the next revision to this PIP.

1.5 Contract Support

The PRM production contract was awarded to Allied-Signal Aerospace/Bendix Communication Division (hereafter referred to as Allied-Signal) on March 27, 1992. PRM limited production systems are being procured under a noncompetitive firm-fixed price contract. The contract includes five systems with options for additional three systems. (Source: Contract DTFAO1-92-C-00019, dated March 27,1992).

The following FAA/contractor activities are responsible for or assist in implementation tasks:

AXX-420/450;ANS-700;AND-450; TAC Support;NISC; Allied-Signal	Implementation Activities; PIP, GSIP, Site Surveys, Field Assistance
AXX-420/450;AND-450;AND-419;TAC Support; NISC, Allied-Signal	Site Surveys, Interdependencies
NISC; AND-450; AXX 420/450, Allied-Signal	Field Implementation Issues
AND-450/ASD SEATA; AXX 420/450, Allied-Signal	Planning and Scheduling
ARN-100/AND TAC Support, Allied-Signal	Air Traffic,Logistics Activities, and Product Management Support.

Table 1.5-1:Contractor Support

1.6 Milestones

1.6.1 Phases of Site Implementation

Table 1.6.1- 1 provides estimates of the anticipated duration of each of the phases of site implementation applicable to the PRM acquisition. These estimates may be revised as the acquisition process evolves. Any changes will be included in subsequent revisions to this PIP.

PHASE	TASK
Implementation Planning	Starts prior to installation - ends with site testing - 18 Months
Site Preparation	Begins with site survey and ends with arrival of equipment on site - 12 Months
Installation and Check Out (INCO)	Starts with equipment arrival and ends with testing - 60 days
System Integration	Starts with Contractor Acceptance Inspection (CAI) and ends with Initial Operating Capability (IOC) - 120 days
Field Familiarization	Starts with IOC and ends with Operational ReadinessDemonstration (ORD)- 120days

Dual Operation	N/A
Equipment Removal	Begins from Joint Acceptance Inspection (JAI) and ends with removal of all material and test equipment connected with the implementation of the PRM - 90 davs

Table 1.6.1-1:Phases of Site Implementation

1.6.2 Implementation Milestones

Table 1.6.2-1 identifies the key program milestones for the PRM. (Source: In Service Review Brief, September 25, 1997)

EVENT	DATE
Contract Award	November 16, 1992
Critical Design Review	March 31, 1993
In-Service Decision	September 25, 1997
Delivery, MNSP	December 28, 1994
Start ORD	March 25, 1997
First Site Commissioning	October 6, 1997
Last Deliverv	2002

Table 1.6.2-1: Implementation Milestones

1.6.3 Key Product Milestones

Table 1.6.3-1 identifies the locations and delivery dates for the PRM. (Source: In Service Review Brief, September 25,1997)

LOCATION	DELIVERY DATE
Minneapolis St. Paul	December 28, 1994
St. Louis	March 15, 1998
New York, JFK	September 14, 1998
Philadelphia	March 15, 2000
Atlanta	2002

Table 1.6.3-1:Key Product Milestones

2.0 AIRWAY FACILITIES (AF) OPERATIONS

2.1 Operational Workload Impacts

Allied-Signal is responsible for the complete turn-key installation of the PRM system at each of the installation sites. As such, Allied-Signal is responsible for:

(a) Site Evaluation
(b) Development of construction and installation plans and reports.
(d) Site preparation and construction.
- Relocation of existing ATC equipment (if required).
- Conduct of Government-witnessed contractor acceptance tests.

Maintenance for the PRM is guided by FAA Order 6360.19, Maintenance of PRM Facilities, and establishes guidance for the conduct of maintenance support for the PRM system. The PRM Limited Production Program will employ a two-level maintenance concept, site and depot. Site level maintenance consist of fault isolation, LRU replacement, and preventive maintenance tasks. Depot level maintenance consists of repairing failed LRUs shipped from the system site and software maintenance support.

Allied-Signal will furnish complete Interim Contractor Depot Logistics Support (ICDLS) for PRM for the life of the system. The FAA Logistics Center (FAALC) will manage the ICDLS and will serve as the single point of contact between site level maintenance activities and the contractor support at depot level. A detailed description of the maintenance for PRM is found in the PRM Equipment Instruction Handbook, TI 6360.106 (Source: PRM TOR Handbook, dated October 22, 1997)

It is anticipated that the only FAA operational requirement during this ICDLS period will be an oversight role by AF.

Training for air traffic controllers and AF technicians will be provided by Allied-Signal in accordance with FAA-STD-028A. This training will be conducted for each of the 5 PRM sites. Detail information regarding this training may be found in the ILSP and the PRM TOR Handbooks. Controller training will address the operation of the PRM system. Training for technicians is designed to train FAA technicians on PRM troubleshooting, repair, preventive maintenance, and certification training.

A Regional Tracking Program (RTP) network has not been developed for the PRM system. This is planned for the second quarter, FY98. The PRM Generic Site Implementation Plan (GSIP) (Appendix B) is the basis for much of the data shown in the Tables in this Section of the PIP. The PRM GSIP will be refined as required based on feedback from the field and as results of the RTP development are published.

During the ICDLS, data will be collected on workload impacts, e.g. training, maintenance etc. This actual data will also be used to update data found in Table 2.2.-1. The following implementation phases are addressed in the table: Implementation Planning, Site Preparation, INCO, System Integration, Field Familiarization and Equipment Removal.

2.2 Regional F & E Role in Product Implementation

Table 2.2-1 contains estimates of the projected impacts to FAA Regional F&E workloads during the implementation phases of PRM. Activities and resource requirements identified were derived from the PRM GSIP and by comparing PRM with other systems, having similar characteristics.

This workload data is intended as an assist for Regions to plan their activities. It should be noted that some of these activities may be performed in parallel, therefore the data should be viewed accordingly. Also, "resource days" are staff days, and the "activity duration" represents the period during which the activity will take place (could include the actual activity and associated report etc.)

Site Implementation Phase (RTP Activity Number)	Activity	Position Type	Resources (Days)	Activity Duration (Days)
Implementation Planning (00000)	Assess Impact	RAPM	5	10
	Assess Training Rqmts	Radar Engr Radar Tech	2 2	2 2
	Site Survey	Automation Engr Radar Engr Radar Tech	5 5 5	40
	Engineering Electronic	Automation Engr Drafting Radar Engr Clerical Support Specialist	15 5 15 1	45
Installation and Check-Out (INCO)	Electronic Contractor	Radar Engr Radar Tech	5 5	10

(04600)	Engineering	TOR	10	
INCO (04800)	Electronic Contractor Test and Acceptance	Radar Engr Radar Tech TOR	2 2 10	10
INCO (08000)	JAI	Logistics Spec Radar Engr Radar Tech TOR	1 1 1 1	5
Field Familiarization (08200)	AF Training	Radar Engr Radar Tech	1 1	1 1
	Commissioning	Radar Tech Sector Mgt	1 1	1 1

Table 2.2-1: F&E Workload

2.3 System Management Office (SMO) Role in Product Implementation

This section identifies the System Management Office (SMO) workload associated with product implementation of the PRM. This data will continue to be refined with input from the Regions and the RTP and from data collected from the ICDLS.
Changes to the data in this table will be published in the next revision to this PIP.

Site Implementation Phase (RTP Activity Number)	Activity	Position Type	Resources (Days)	Activity Duration (Days)
Installation and Check-Out (INCO) (04600)	Electronic Contractor Engineering	Radar Tech	5	5
INCO (04800)	Electronic Contractor Test and Acceptance	Radar Tech	2	2
INCO (08000)	JAI	Radar Tech TOR	1 1	1
Field Familiarization (08200)	Commissioning	Radar Tech SMO Mgr	1 1	1

Table 2.3-1: SMO Workload

2.4 Labor-Management Relations

Regional Airway Facilities employees associated with the PRM implementation are represented by the Professional Airways Systems Specialists - Airway Facilities Unit (PASS/AF). Under the Federal Labor Management Relations Statute, the FAA must negotiate any adverse impact on bargaining unit employees prior to implementing changes to personnel policies, practices, or other conditions of employment (Source:

The PRM Product Team may request employee participation to the development and implementation of the system through various means, such as work groups, surveys, site visits, and testing of the equipment. Permission for bargaining unit employees to participate in these efforts must be obtained through AFZ-300. AFZ-300 will communicate these requirements to the appropriate union.

2.5 System Certification

PRM certification requirements are guided by FAA Order 6360.19, "Maintenance of Precision Runway Monitor (PRM Facilities). The information found in this document augments guidance found in FAA Order 6000.15 , General Maintenance Handbook for Airway Facilities.

The basis of technical certification is the verification that the PRM system is providing the required service to the FAA community within the prescribed handbook tolerances and limits.

For PRM, daily and quarterly certification are required. Daily certification consist of reviewing the system status through the PRM status display . The Quarterly certification will test the functioning of PRM with external test equipment (Source: FAA Order 6360.19)

3.0 AT Operations

3.1 Operational Workload Impacts

No airspace changes are planned for PRM. However there will be some impact on AT operations as a result of fielding this system.

PRM is a key program developed specifically to alleviate airport arrival delays. The PRM allows airports to conduct independent simultaneous instrument approaches to runways spaced less than 4300 feet apart. ILS approaches with runways spacing of 3000 ft. may be used if one localizer is offset 2.5 degrees. Independent runway usage is available with 700 ft. runway spacings during Visual Meteorological Conditions (VMC) and IMC with runway spacings greater than 4300 ft.

Five Airports in the United States with runway spacings less than 4300 feet will benefit from delay savings. They are: Minneapolis, runway spacing - 3380 ft; John F. Kennedy, 3000 ft; Philadelphia, 3000 ft; Atlanta, 4100; and STL. Also, JFK and PHL have one approach offset (LOC) between 2.5 to 3 degrees while the other approach is straight-in. STL is a unique application of PRM to runways spacing of 1300 ft apart to lower WX minima to 4 miles and 1000' ceiling.

Air traffic controllers are currently receiving three days of classroom training for PRM. This includes training on a desktop PC trainer. In addition, they receive a minimum of 8 hours of actual position training prior to certification. Training includes system characteristics, functional and procedures training.

Pilot training consists of watching a video and reading an information page for a PRM operations airport prior to participating in PRM procedures. There is no requirement for flight simulator training however, some U.S. domestic airlines stated they will eventually include PRM procedures in their overall pilot training.

Table 3. l-l identifies some impact areas on AT personnel. Data in this table will be reassessed with the experience gained at Minneapolis-St. Paul. Changes to this data will be reflected in the next revision to this PIP.

Site Implementation Phase (RTP Activity Number)	Activity	Position Type	Resources (Days)	Number of Personnel Required	Activity Duration (Days)
Field Familiarization	AT Ops Trng	AT Controller	1	All Site Controllers	1

(06000)					
Field Familiarization (07500)	Field Familiarization	AT Controller	10	All Site Controllers	10

Table 3.1-1 : AT Operational Workload

3.2 Regional Role in Product Implementation

Table 3.2-1 identifies some of the activities that regional AT personnel will participate in during PRM implementation.

Resource requirements are estimates based on past experiences with systems having similar characteristics. Regions are encouraged to modify these estimates to suit their specific situations. Air Traffic personnel are encouraged to input to this table as more timely data becomes available.

Site Implementation Phase (RTP Activity Number)	Activity	Position Type	Resources (Days)	Number of Personnel Required	Activity Duration (Days)
Planning (00000)	Assess Impacts	ATR	2	1	2
	Assess Training Rqmts	ATR	2	1	2
Field Familiarization (05400)	FAA Integration & Testing	AT Controller	10	1	10

Table 3.2-1:AT Impact

3.3 Labor-Management Relations

Regional Air Traffic employees associated with the fielding of PRM are represented by the National Air Traffic Controllers Association (NATCA). Provisions for the Federal Labor Management Relations Statute relating to AF activities noted in Section 2.0 above apply equally to AT operations. Permission for bargaining unit employees to participate in these endeavors must be obtained through AFZ-300. AFZ-300 will communicate these requirements to the appropriate union.

3.4 Flight Standards

The key Flight Standard changes for PRM are the new approach plates and training requirements for pilots. The latter consist of the use of a training video tape and written training materials.

Essentially, flight standard requirements (both AFS and ATC) are in place that also satisfy technical requirements for PRM and therefore there will not be any further impact to ATC. Flight inspection procedures for the PRM are identified in FAA Order 8200.XX. Flight inspection will define the recognition accuracy provided by the controller and coverage of the system. Results obtained will be used by ground personnel to determine if the system will support air traffic operational requirements. Ground personnel will advise the flight inspector of facility status whenever a change occurs.

Flight inspections are required for initial and subsequent certifications of the PRM in accordance with FAA Order 8200.XX. In addition, the flight inspector will coordinate with air traffic to obtain all site specific data.

4.0 SYSTEM CONFIGURATION

4.1 NAS Level Architecture

The primary mission of the PRM is to maintain airport capacity by providing the capability to conduct simultaneous independent instrument approaches to parallel runways spaced less than 4300 feet apart. Currently deployed systems have inherent limitations restricting their ability to meet the goals of the PRM system.

Runway approach monitoring is currently provided by Terminal radar Approach Control (TRACON) facilities including Airport Surveillance Radar (ASR-4/5//7/8/9/10/11) systems, Air Traffic control Beacon Interrogators (ATCBI-3/4/5) and the Automated Radar Terminal System (ARTS). These systems provide sufficient accuracy, data update interval, and display resolution to monitor independent approaches to parallel runways separated by 4300 feet or more during instrument meteorological conditions (IMC)
(Source: TI6360.106 Maintenance Handbook)

Figure 4. l-l provides a perspective of a typical PRM T/R site.

4.2 Product Description

4.2.1 Functional Performance Characteristics

The PRM is a secondary surveillance radar and display system capable of providing the aircraft surveillance necessary to reduce runway separation criteria applied to the independent operation of parallel runways during Instrumented Meteorological Conditions (IMC).

The PRM utilizes an electronically steered phased-array antenna to provide variable update intervals to detect and display target aircraft. The PRM detects aircraft throughout its 360 degree coverage area and provides automatic tracking of the aircraft in operator-selected regions, nominally the parallel runway landing sector and missed approach sector.

The primary features and characteristics of the PRM include the following:

(a) Operation in accordance with Order 1010.51A, U.S. National Aviation Standard for the Mark X Air Traffic Control Beacon System
(b) Mode 3/A and Mode C interrogation and decoding
(c) Electronically - steered antenna providing 360 degree azimuth coverage, O-l 5,000 feet altitude coverage, and 32 mi range coverage

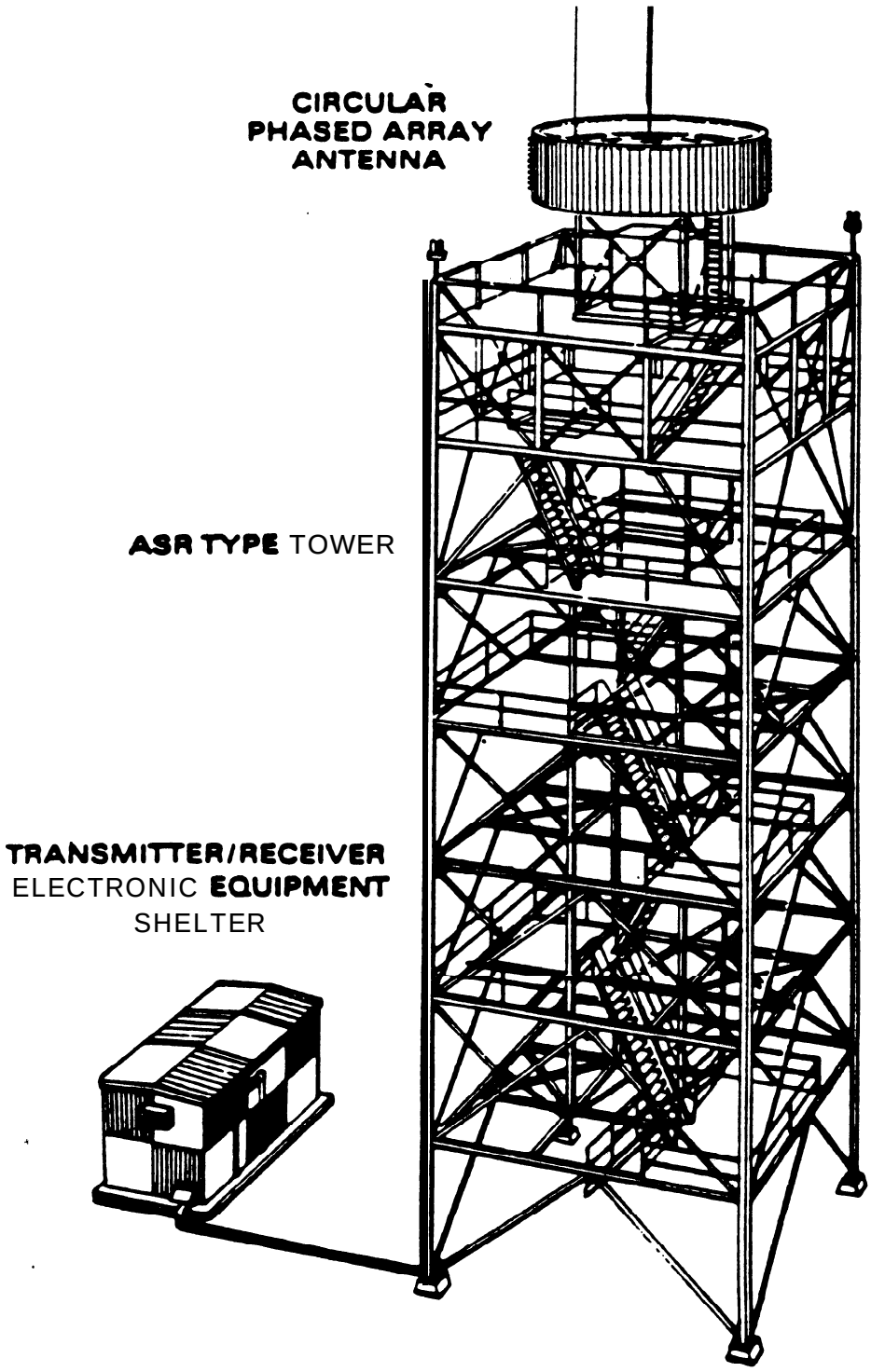

FIGURE 4.1-1: T/R PERSPECTIVE SITE

d) Interrogation and tracking of 35 targets at a 1 .0 second update interval while searching 360 degrees of coverage with a 4.0 second scan rate.

(e) Range accuracy of +/- 30 feet bias and monopulse processing providing azimuth accuracy of .06 degrees rms.
(f) Dual and triple runway monitoring with display background mapping of site - specific geographical data.
(g) High resolution 20" x 20" (2048 x 2048 pixels) operational color graphics displays.
(h) Ground traffic (latitude and velocity) and adjustable coverage area filtering (geographic and altitude).
(I) Automatic blunder alert generation
(j) Automatic correlation of tracked targets with ARTS system data, including runway assignment, aircraft identity (Mode 3A code), flight number, aircraft type, conflict alert, and low altitude alert
(k) A mean-time-between -critical failures (MTBCF) of 2190 hours.
(l) A mean - time - to repair (MTTR) OF .5 hours
(m)Automatic monitoring and diagnostic capabilities to detect 98 percent of all failures and isolate 95 percent of detected failure faults down to no greater than four line replaceable units (LRU) (Source: PRM TOR Handbook , STL, October 22,19970).

Figure 4.2.1-1provides a block diagram showing the functional relationship between the PRM systems including subsystems site locations.

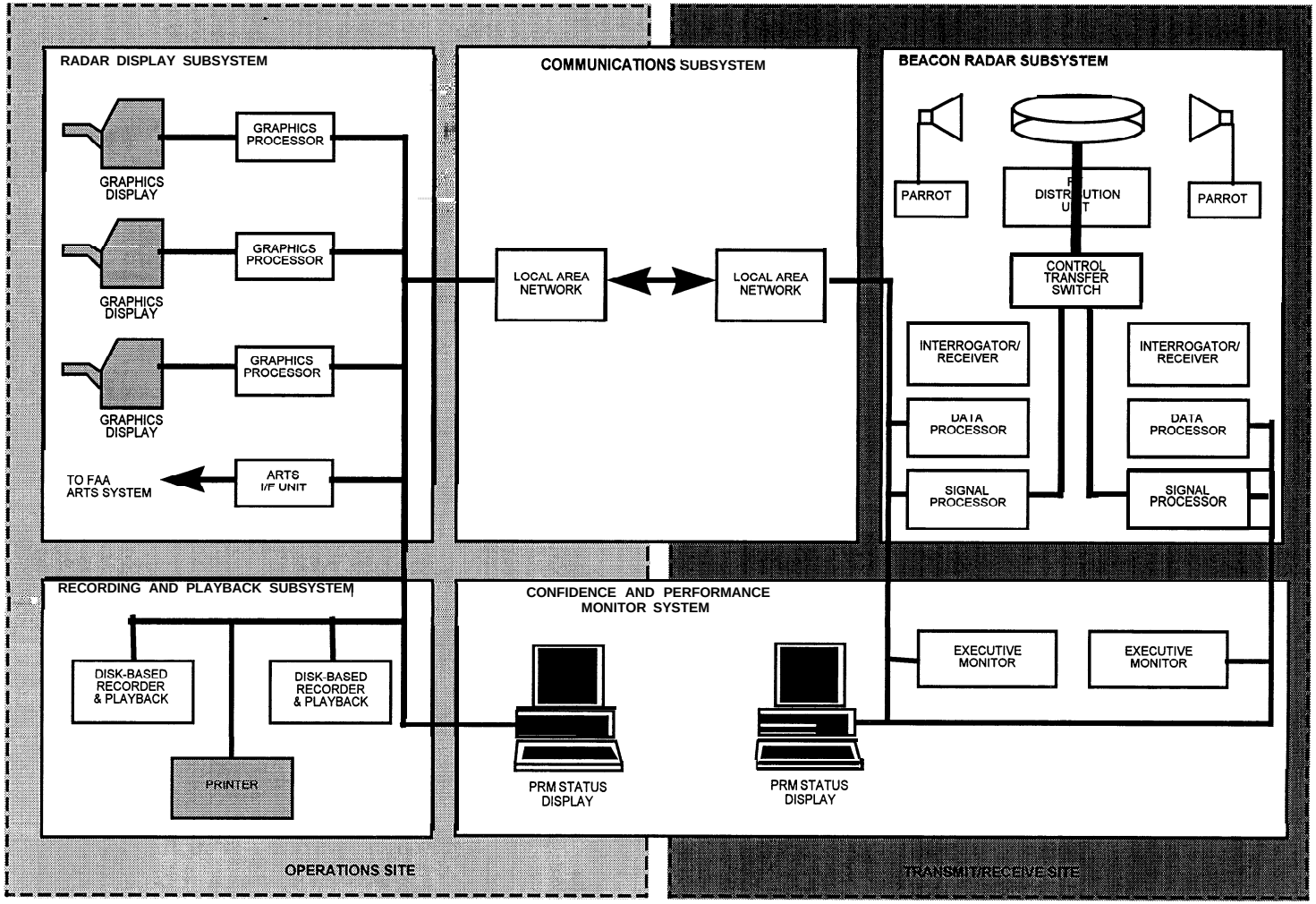

FIGURE 4.2.1-1: FUNCTIONAL RELATIONSHIP

4.2.2 Hardware Configuration Items

The PRM system is comprised of five major subsystems and auxiliary system equipment:

(a) Beacon Radar Subsystem (BRS)
(b) Radar Display Subsystem (RDS)
(c) Communications Subsystem (CS)
(d) Confidence and Performance Monitoring Subsystem (CPMS)
(e) Recording and Playback Subsystem (RPS)

A block diagram showing the functional relationships between the PRM subsystems, including subsystem site locations, is shown in Figure 4.2.2-1.

The BRS provides aircraft surveillance, acquisition, and tracking. The BRS interrogates aircraft transponders, processes the replies, establishes and updates system tracks, and transmits track data to the RDS.

The RDS receives target track data from the BRS, correlates the track data with ARTS data, displays track data on color graphics displays, and generates visual and aural blunder alerts, as required, based on actual and projected aircraft position data.

The CS provides for intra-site communications between the equipment located within the Transmitter/Receiver (T/R) site and within the Operations (Ops) site. The CS also provides the communications between these two sites.

The CPMS provides for the monitoring of critical system performance parameters in the BRS, the RDS, and the CS. The CPMS also provides for maintenance monitoring, including, BRS maintenance control, subsystem and environmental status monitoring, and diagnostic provisions.

The RPS provides for the recording and playback of the operational data presented on the RDS.

Auxiliary system equipment for the PRM system includes a shelter and tower for the operational equipment at the T/R site and a power system to provide and distribute power to the system equipment.

(Source: PRM TOR Handbook, October 22,1997).

4.2.2.1 System Physical Description

PRM equipment is located in one of two areas: the T/R site, typically located on the airport grounds, or the Ops site, located in the FAA TRACON/Equipment room. In addition, two Parrots (ground-based beacon transponders used by the PRM system to check its range and azimuth accuracy's) are installed at a remote site, typically located within 1 mile from the PRM T/R site, dependent upon siting requirements.

Locations, layouts, and descriptions of the PRM Limited Production Program equipment are provided in Figures 4.2-2 through 4.2-4.

(a) Figure 4.2.2. l-l, T/R Site Layout. This figure provides a layout of a typical PRM T/R site. The tower height is typically 77 feet, depending upon the siting requirements.
(b) Figure 4. 2.2.1-2, T/R Site Shelter Equipment Layout. This figure provides an overview of the PRM equipment layout within the contractor-provided PRM T/R Site Shelter.
(c) Figure 4..2.2.1-3, Typical Ops Site Equipment Layout. This figure provides a sample layout of the PRM Ops Site equipment within the TRACON and FAA Equipment Room.

(Source: PRM TOR Handbook, October 22,1997)

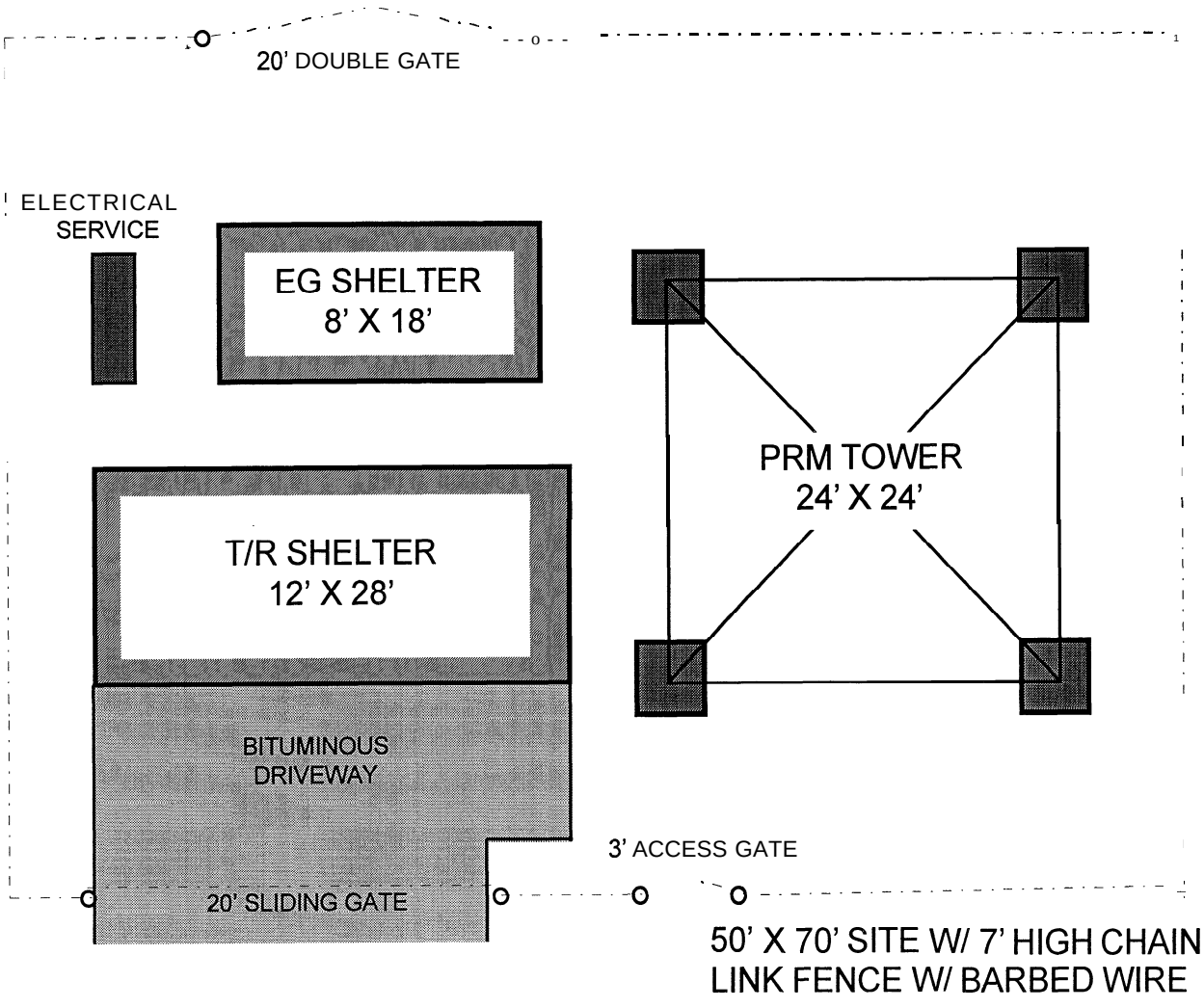

FIGURE 4.2.2.1-1: T/R SITE LAYOUT

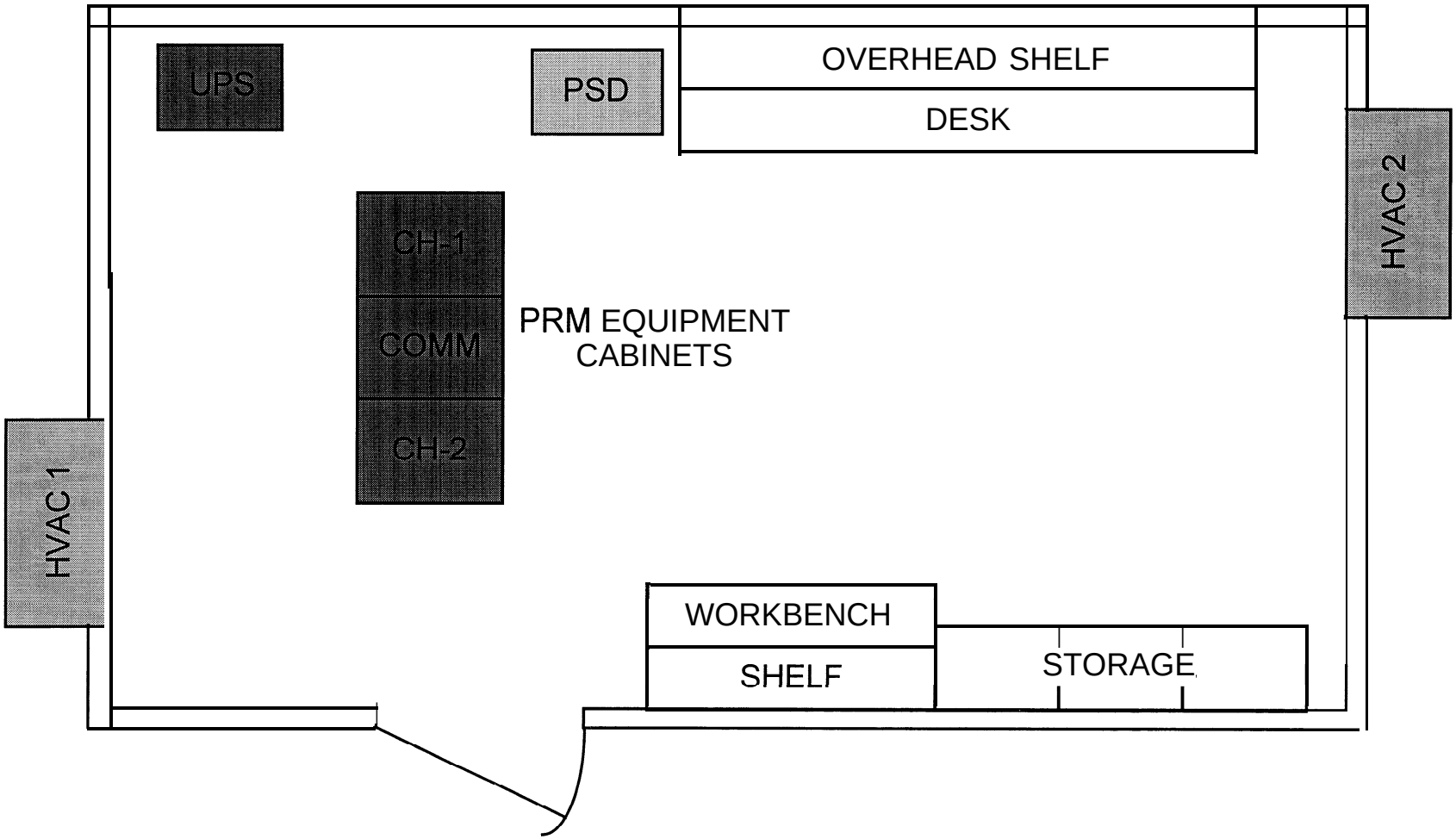

FIGURE 4. 2.2.1-2 T/R SITE SHELTER EQUIPMENT LAYOUT

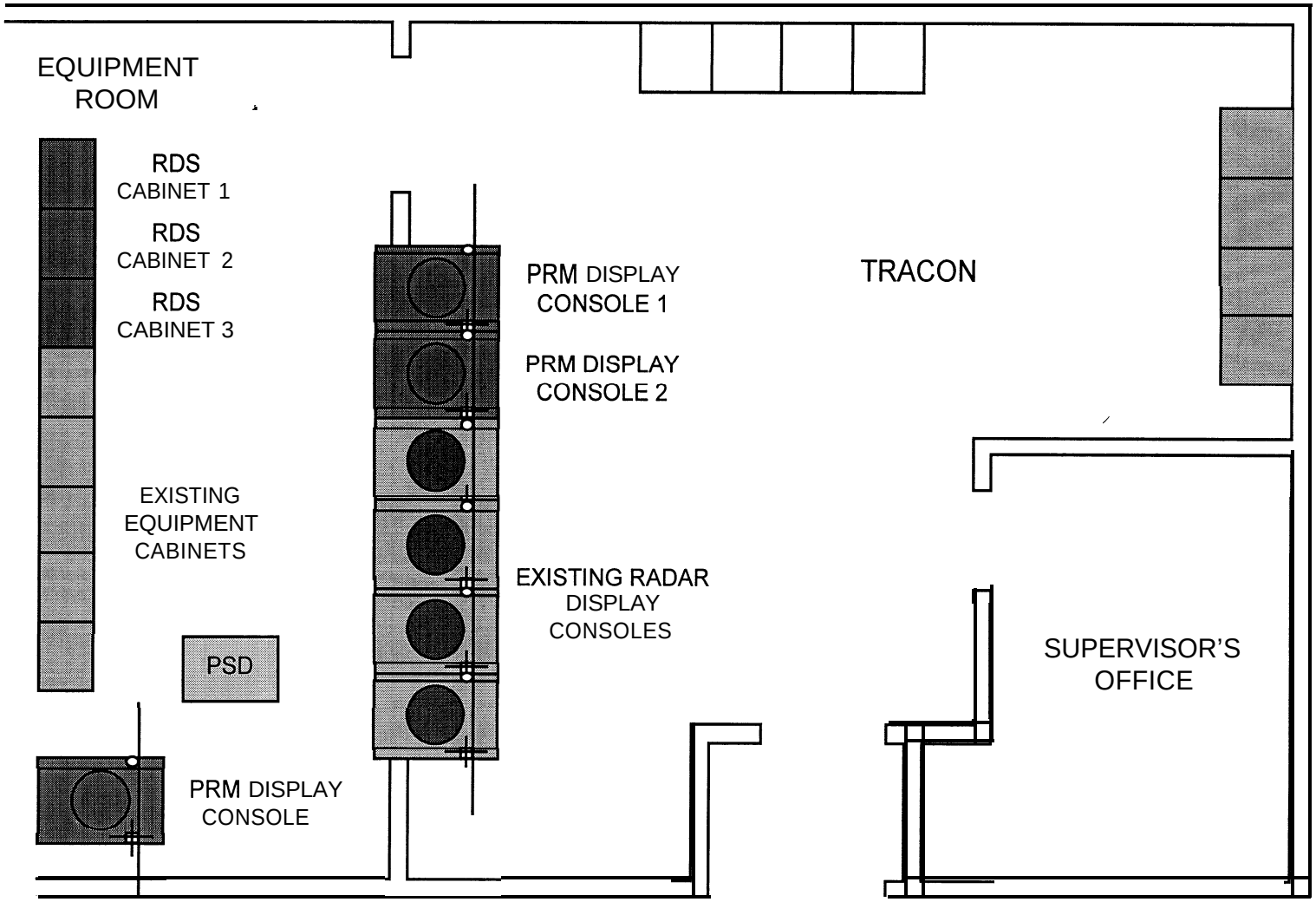

FIGURE 4.2.2.1-3: OFFSITE EQUIPMENT LAYOUT

4.2.3 Software Configuration Items

Allied-Signal will develop a product specification , make maximum use of COTS software, and will develop (for the government) any software not commercially available that is necessary to integrate COTS equipment and software. PRM software is written primarily in C operating system to function in a multitasking environment.

All software documentation delivered by Allied-Signal will be written in accordance with best commercial practices and as tailored by the instructions in the applicable Statement of Work and Specifications FAA-E-2869a and AIU-2869.

4.3 Product Interfaces

4.3.1 External Interfaces

4.3.1.1 ARTS Interface. The PRM system interfaces to the ARTS system version existing at the installation site to facilitate the transfer of ARTS track data to the PRM system. The PRM/ARTS interface is a passive interface with data flow from the ARTS to the PRM system. Data provided to the PRM system consists of track information not available in the PRM system, including runway assignment, aircraft identity (Mode 3/A code), aircraft type, conflict alert, and low altitude alert. This interface is provided as part of the PRM RDS, typically located in the TRACON/Equipment room.

The PRM system is designed to interface with a standard ARTS system, Version IIIA. However, different ARTS system versions may exist at each of the PRM installation sites. In order to compensate for this, an ARTS "patch" must be installed at each of the PRM installation sites where an ARTS system other than Version IIIA exists. This "patch" will allow the existing ARTS system to properly interface with the PRM system. The sites where the PRM systems will be installed will be responsible for the development and installation of this "patch."

The PRM system is also designed to interface with the ARTS IIIE. The PRM/ARTS IIIE interface will function through an ARTS IIIE gateway which has been developed by the Tech Center. Like the ARTS IIIA, an ARTS "patch" must be installed at each of the PRM installation sites where an ARTS system other than Version IIIE exists. This "patch" will allow the existing ARTS system to interface with the PRM system.

4.3.1.2 Engine Generator Interface. The PRM system monitors the operational status of the T/R site engine generator. The operational status of the engine generator is provided a low voltage DC signal provided by the engine generator via a sensor junction box which is located in the engine generator shelter.

4.3..2. Internal Interface. The PRM communication subsystem provides for intra-site data communications between the equipment located at the T/R site and the OPS site. The

communications subsystem also provides intra-site data communications between these two sites via a fiber optic link

(Source: TI 6360.106, dated March 17, 1997)

4.4 Platform Architecture

The NAS consists of three major physical platform groupings: Enroute (Air Route Traffic Control Center (ARTCC)/Large TRACON), Terminal (ATCT/TRACON), and Airway Support Facilities. The PRM is an element of the Terminal platform.

Coordination and plans for interfacing with the various ANS platform activities will follow standard procedures identified in Implementation Process Guideline, February 1997.

As noted in Section 1.5 of this PIP, a total of five systems will be deployed: Minneapolis-St. Paul, St. Louis, New York/JFK, Philadelphia and Atlanta.

Cable routing and raised floor requirements shall be consistent with requirements and as defined in FAA Specification FAA-E- 2887a, specification and the applicable SOWs.

Electrical cable design and layout will preclude damage to electrical cabling and interference with system equipment during all conditions of assembly, removal, insertion, repair, and tilting of BRS system equipment.

All cabling will be protected against the environment and physical damage. Metal wireways shall be used for routing of cabling on internal shelter surfaces Steel conduit will be used for routing of cabling on exterior shelter surfaces. The conduit will be bonded to the site grounding system.

5.3.1 Tower to Shelter. Low - loss phase matched cables transport the transmitted, received, and test signals to the transmitter/receiver equipment shelter located on the ground near the base of the tower. A multiconductor signal cable transmits antenna control signals from the Interrogator cabinets in the shelter to the RFD at the antenna.

5.3.2 Engine Generator to Shelter. A 16 AWG shielded cable provides a low voltage DC signal from the engine generator sensor junction box to the Prm T/R shelter sensor junction box.

5.3.3 Graphics Processors to Displays. Two of the displays are physically located in the operations room, whereas the three equipment cabinets and the one remaining display are located in the equipment room. Interconnection between each Graphics Processor cabinet and its display is through 5 coaxial cables and 4 multiconductor digital control cables.

5.3.4 Intersite Cabling. The T/R site shelter communicates data to and from the OPS site via single ethernet fiber optic cable. Power at 208 VAC 3-phase must be provided to the shelter and 120 VAC single phase to the Ops Site. Power is passed through the shelter to supply power to the ADA, RFD, and tower obstruction lightning (Source: FAA-E-2887a, January 22, 1997).

5.4 Power

5.4.1 Power Requirements

All power distribution and cabling with the equipment shelter will be in accordance with the NFPA-70-1990. The main power panel in the shelter shall distribute power to the operational system equipment and will contain, but not be limited to the following:

(a) Main circuit beaker
(b) Separate equipment circuit breakers as required
(c) Lightning circuit breakers
(d) Service outlets circuit breakers
(e) Shelter environment control circuit breakers
(f) Tower equipment circuit breakers
(g) A minimum of 20 percent spare circuit breaker capacity

All wiring, cabling, junctions, connectors, and panels will be sized to handle the maximum power required in accordance with NFPA-70-1990.

Circuit breakers will be connected in series with all power connectors as specified in NFPA 70-1987 for grounded source power. Overcurrent devices shall be connected to the load side of the power switches. Circuit breakers shall be sized in accordance with NFPA-70-1990.

PRM equipment located at the Ops Site will be tied into either the local FAA or airport Critical Power Bus. PRM equipment located at the T/R site will be tied into a government furnished engine generator and contractor- supplied UPS.

Power to the antenna heaters via the ADA will either be supplied by direct commercial power or by the EG. This is dependent upon the site requirements and regional input.

Power requirements are shown in Table 5.4.1-1

				Load (KW) on Power Bus		
Site Location	**Configuration Item**	**Voltage**	**Phase**	**Critical** (See Sect. **5.4.4** Below)	**Essential**	**Commercial** (See Sect. **5.4.3** Below)
Antenna Tower	Antenna RF Distribution Unit (FRD) Array Distribution Assembly (ADA)	120 120 208	single single three	Powered by PRM EG and on-site UPS Powered by PRM EG and commercial (site specific)	n/a	
T/R Site Shelter	Channel 1 Cabinet Channel 2 Cabinet Auxiliary Cabinet PSD PSD Printer HVAC No. 1 HVAC No.2	120 120 120 120 120 240 240	single single single single single three three	Powered by PRM EG and on-site UPS	Powered by PRM EG	
FAA Radar Equipment Room	RDS Cabinet 1 RDS Cabinet 2 RDS Cabinet 3 PSD PSD Printer RPS Printer Speaker Display	120 120 120 120 120 120 n/a 120	1 1 1 1 1 1 n/a 1	All Critical	n/a	
TRACON	Display Console 1 Display Console 2	120 120	1 1	All Critical	n/a	
Remote Site	Parrot Parrot Antenna	120 n/a	1	n/a	n/a	Battery Back-up

Table 5.4.1-1 Power Requirements

5.4.2. Power System Components

Power to the PRM system will be provided from commercially available prime power. The PRM power system will provide power to all operational equipment within the required voltages and frequency tolerances for system operation. The power system shall consist of the input commercial power, a contractor-provided uninterruptible power system (UPS), and all switching, distribution, and cabling required for proper system operation

5.4.3 Primary Power Requirements

Prime power requirements of the T/R site equipment, which includes all items provided by the contractor, will be met via ties to commercial power, with no ties to FAA power sources. Operational site power requirements shall not exceed 14 and 17 KVA for 3 and 4 GDSs and associated equipment located at the operations site, respectively. The design center voltages for PRM system equipment shall be 60Hz, 208 V, Phase-to-Phase and 120 V Phase-to-Neutral with a maximum voltage range allowance of +/-15 percent. (Source: FAA-E-2887a)

5.4.4 Uninterrupted Power System (UPS)

An UPS, located at the T/R site and provided by Allied-Signal supplies power to the PRM T/R site with the exception of the antenna heaters, in the event of a commercial power system failure. The UPS shall be on-line at all times, and shall have the capacity to power the complete PRM system for 5 minutes in the event of a commercial power system failure. The UPS battery system shall be sized to provide continuity of operation, shall be vented, as required, and will be designed in accordance with local codes for installation in manned environments. (Source: FAA-E-2887a)

5.5 Security, Safety, and Health

5.5.1 Security

Each site is responsible for facility physical security and personnel safety in accordance with FAA policy and standards.

Preparation, installation, and testing will most likely be at the T/R Site Shelter and at the TRACON. No security clearances will be required to access the areas within the TRACON. Access to the TRACON will require entry by an escort. Allied-Signal personnel on-site for a prolonged period of time will obtain, through airport security, a badge allowing access to the without escort. Allied Systems personnel will coordinate all visits to the site with the FAA personnel who will be identified by AND-450 at the appropriate times in the implementation schedule. An FAA escort is required for all work done in the TRACON.

Allied-Signal will provide the Technical On-Site Representative (TOR) with a list of contractor personnel who will require access to the site. The list shall be kept current during project work. Allied-Signal will provide all personnel with readily identifiable numbered badges during the

period their access to the site is required. Badges will be shown to the FAA on site representative prior to site entry and shall be worn on outer clothes while at work at the site.

5.5.2 Safety and Health

The PRM system will comply with the personnel safety requirements listed in FAA Specification FAA-E-2887a, "Personnel Safety" requirements of FAA-G-2100F, and FAA Order 3900.19(a). or with an equivalent industry standard, approved by the Government. Applicable standards issued by the Secretary of Labor at 29 Code of Federal Regulations (CFR) 29 CFR Part 1960, 29 CFR Part 1926 and 29 CFR 1910 also apply.

5.6 Environmental / HAZMAT

Although there are no known hazardous material in the PRM, this area will be closely evaluated during site surveys to ensure that no adverse environmental conditions exists.

FAA Order 1050.17, Airway Facilities Environmental and Safety Compliance Program and the National Environmental Policy ACT (NEPA) requires FAA to conduct environmental assessments to consider environmental consequences of FAA actions and activities.

FAA Order 1050.19, Environmental Due Diligence Audits in the Conduct of FAA Real Property Transactions, establishes policy, procedures/responsibilities, and implementation guidelines for performing environmental due diligence audits (EDDAs) in the acquisition and disposal of real property. This does not apply for PRM.

5.7 Grounding, Bonding, Shielding & Lightning Protection

Requirements for lightning protection, grounding, shielding, bonding , and transient protection shall be as specified by FAA-STD-019 and FAA-STD-020. The government will furnish the earth ground and AC power ground at FAA installation locations. The contractor shall furnish all other grounds as required by FAA-STD-20.

A common system grounding design in accordance with FAA-STD-019 (para.3.11, 3.12) and FAA-STD-020 shall be used for all units to be delivered.

All equipment shall be protected from the effects of lightning as specified in FAA Order 6950.19, Chapter 2 and FAA-STD-019 (par. 3.9). (Source: FAA-E-2887a)

5.8 Space

The FAA will assist Allied-Signal and in the development of preliminary equipment layout plans and cable routing diagrams based on the information provided in the PRM Site Survey Reports and Installation Plans prepared by Allied-Signal.

There are no contractor space requirements for the PRM program. This includes administrative space, training etc.

5.9 Product Dimensions and Weight

PRM equipment located in the TRACON and at the shelter require the approximate floor space indicated in Table 5.9-1. (Source: FSRDB, February 1996/ PRM TOR Hndk, STL October 22, 1997.

EQUIPMENT COMPONENT	DIMENSIONS W-D-H (inches)	WEIGHT (pounds)
Antenna	17.0 ft in diameter	Not Applicable
RF Distribution Unit (RFD)	49.3"W 38.5"D 61.5"H	2000.0 lb.
Array Distribution Assembly (ADA)	72"W 12"D 72"H	2000.0bs
Channel 1 Cabinet	21.0"W 31.9"D 80.0"H	652.0 lb.
Channel 2 Cabinet	21.0"W 31.9"D 80.0"H	652.0 lb.
Auxiliary Cabinet	21.0"W 31.9"D 80.0"H	652.0 lb.
PSD (Note 1)	19.0"W 22.0"D 21.0"H	40.0 lb.
PSD Printer (Note 1)	18.0"W 12.0"D 16.0"H	12.0 lb.
UPS	11.5"W 32.0"D 31.0"H	495.0 lb.
HVAC No. 1	65.0"W 40.0"D 24.0"H	580.0 lb.
HVAC No. 2	65.0"W 40.0"D 24.0"H	580.0 lb.
RDS Cabinet 1	21.0"W 31.9"D 80.0"H	785.0 lb.
RDS Cabinet 2	21.0"W 31.9"D 80.0"H	785.0 lb.
RDS Cabinet 3	21.0"W 31.9"D 80.0"H	677.0 lb.

PSD (Note 1)	19.0"W 22.0"D 21.0"H	40.0 lb.
PSD Printer (Note 1)	18.0"W 12.0"D 16.0"H	12.0 lb.
RPS Printer (Note 1)	18.0"W 12.0"D 16.0"H	12.0 lb.
Speaker (Note 2)	12.0" x 12.0"	5.0 lb.
UPS	32.0"W 32.0"D 45.7"H	1400.0 lb.
Display Console 3	30.0"W 56.0"D 48.0"H	980.0 lb.
Display Console 1	30.0"W 56.0"D 48.0"H	980.0 lb.
Display Console 2	30.0"W 56.0"D 48.0"H	980.0 lb.
Parrot	24.0"W 12.0"D 30.0"H	100.0 lb.
Parrot Antenna	34.8"W 42.5"D 29.8"H	50.0 lb.

Table 5.9-1:Dimensions/Weight

Note 1: The PSD and PSD/RPS printers are PC platforms intended for desktop use
Note 2: The Speaker is a wall-mounted unit

5.10 Construction & Modification

Construction requirements and plans for the PRM system can be found in the PRM Technical On Site Representative (TOR) Handbook, developed for each site.

Air Traffic requirements will have priority over all contractor activities. Allied-Signal will ensure that services are provided in such a manner that avoids disruptions to Air Traffic Control facilities and supports the procedures considered essential by FAA for assuring safety in air traffic control.

5.11 Telecommunications

A typical PRM installation has no telecom requirements other than a phone installed in the T/R site, which is handled by Allied-Signal.

A voice TELCO line will be installed by Allied-Signal at the T/R site as part of the turnkey installation. The FAA will take over this line at CAI.

Where a T/R site is not connected to the indicator site by FAA optical fibers, a T1 telephone line may be leased from the appropriate telephone company. For example, as part of the JFK installation, a T-l line will be established between the T/R site and the NY TRACON to transmit PRM data back to the NY TRACON.

5.12 Utilities/Roadways

Repair and upgrading the PRM sites will depend on the condition of the existing roadways and access to the T/R site and the TRACON. For example, JFK will require a new paved roadway. This will be funded out of installation costs provided by the Product Office.

Electrical power to each PRM site is required. Each region earmarked for a PRM is responsible for coordinating with their local electrical utility companies, when necessary to provide adequate power to each site.

6.0 IMPLEMENTATION REQUIREMENTS

6.1 Implementation Management

6.1.1 Associate Product Lead for NAS Implementation (APLNI)/Implementation Support Specialist (ISS)

The APLNI is Khalil Kodsi, ANS-700 (202-267-3622). The APLNI will coordinate all product implementation matters for PRM. The ISS for PRM is Dick LaFrance NISC/ANS-700, (202-646-2111). The ISS is responsible for maintaining this PIP, planning and coordinating program implementation matters for PRM with the AND-450 staff and support personnel, and serving as an information bridge between headquarters, region, and other field activities.

The ISS will work directly with members of the PRM Product Team concerning implementation matters. The ISS is responsible for routinely reporting product status information to AF management and to ANS platform managers. The ISS facilitates the identification of issues impacting implementation for the PRM. The ISS helps pursue the resolution of these issues by communicating with the other Product Team members and the affected platform managers. He elevates issues, as necessary.

6.1.2 Support Team Members

Table 6.1.2-1 below lists all members of the PRM TEAM. This is a fluid environment, and personnel changes occur frequently. Although the team roster was reviewed carefully, changes may have occurred since the table was constructed. RAPMs are listed separately in Table 6.1.4-1.

NAME/OFFICE	POSITION	TELEPHONE (202 numbers unless otherwise noted)
Herb Goldstein, AND-450	Product Lead for Secondary Surveillance	267-5165
Gene Wong, AND-450	Product Lead, PRM	267-5339
Wayne Sutler, AND-450	Technical Officer	267-5165
Sarah McLaurin, ASU-320	Contracting Officer	267-5165
Jeff Livings, ACT-310	Test Director	609-484-5995
Lee Eudy, ASU-423	Quality Reliability Officer	410-337-7485
Scott Schlegel, ARN-100	Logistics	493-0699
Garry Long, AFZ-100	Training	493-4067
Catherine Perkins, AFZ-100/NISC	Training	646-5484
David Piszczek, ASD-220	Configuration Management	358-5188
Khalil Kodsi, ANS-700	Implementation	267-3622
Dick LaFrance, ANS-700/NISC	Implementation	646-2111
Tim Irvin, AND-410/TAC	TACT Support	(703) 902-5241
Grant Ozment, AOS-230	Surveillance, Engr	405-954-4993
Spyder Thomas, AFS-405	Flight Standards	267-3726

Tom DeFranco, AND-450/TAC	TACT Support	(703) 902-5178
Guy Hawkes, AOS-100	In Service Review	267-7489
Chuck Herbolsheimer, AOS-100/NISC	In Service Review	646-2335
Chuck Dudas, ACT-310	Test Engineer	609-485-6818
Harold Anderson, ARN-100	Air Traffic Requirements	366-9198
Rick Ozmore, ACT-510	ATC Simulation/Test	609-485-5368
David Madison	Air Traffic Operations	267-9938
Steve Lenertz	NATCA Representative, MSP Tower	612-713-4000

Table 6.1.2-1: PRM Team Members

6.1.3 Field Level Involvement

An implementation team is in place for PRM. Monthly telecons are conducted and site visits are routinely made.

The implementation team is designed to function as a working entity and is normally comprised of members of the Product Team, ANS-700, ARN-100, ASU, and augmented with Regional AF and AT personnel at regional and facility locations. Additional members may be identified to address specific program needs. The Tech Center, the Aeronautical Center, etc are also represented on the implementation team as circumstances dictate.

In addition the ISS works through the implementation team in doing the following:

(a) Coordinating PIP and GSIP development
(b) Supporting identification and incorporation of implementation related requirements into the Integrated Product Plan (IPP) and procurement documents
(c) Working with the Product Lead in facilitating the implementation process
(d) Validating implementation strategies proposed by the equipment contractor
(e) Supporting resolution of program implementation and transition issues and
(f) Facilitating compliance with implementation policy

6.1.4 Regional Associate Program Manager (RAPM)

Based on current planning for PRM implementation, the RAPMs will be responsible for the following. The list is not all inclusive and may vary by region.

(a) Monitoring implementation activities and report status/progress to IPT
(b) Preparing cost estimates and funding requests for site activities
(c) Reporting installation progress and status to the IPT
(d) Coordinating and helping obtain appropriate sites and utilities for the PRM
(e) Coordinating site preparations for pole installations and PRM hardware/software
(f) Coordinating the submission of telecommunication service requests
(g) Coordinating the selection of a TOR for construction and installation
(h) Coordinating the integration, transition, and commissioning of the PRM

(i) Coordinating the disposition of equipment removed/replaced

Table 6.1.4-1 below is a listing of current RAPMs.

REGION	NAME/OFFICE	TELEPHONE
Great Lakes	Rick Murphy/ANI-459.9	847-294-7590
Eastern	Nayla Malek/ANI-220	718-553-1176
Southern	Walt Carter/ANI-308S	404-305-6299
Central	Lee Riffel, ANI-500	816-426-5676

Table 6.1.4-1:RAPMs

6.1.5 Technical On-site Representative (TOR) and Resident Engineer(RE)

The TORs serve as the focal point in the respective regions for PRM site preparation and installation activities. As the product lead's regional representatives, they work closely with the Product Office and Allied-Signal at the implementation sites. TORs are appointed by the Contracting Officer's Technical Officer, after designation by the NAS Implementation branches and are accountable for ensuring that the PRM equipment is fielded in an orderly manner.

Responsibilities include: ensuring delivery of components, installation, checkout, and acceptance. If subcontractors are used, Allied-Signal will be responsible for all subcontractor(s) performance.

RE positions may be combined with the TOR responsibilities, and some or all of the functions may be performed by the Regional APM. The TOR and Contracting Officer's Representative (COR) serve as the focal points in the respective regions for the PRM site preparation and construction activities. As the product lead's site representatives, they work closely with the contractor at the site. They are accountable for ensuring that the PRM site preparation and construction occurs in an orderly manner. The specific names, offices, and telephone numbers of the REs will be incorporated in this PIP as soon as they are identified.

A TOR/REs are appointed to witness and participate in the installation, integration, and verification activities at each PRM site. The following list of activities is not all inclusive and may vary by region.

The TORs

(a) Serve as the focal point for all matters pertaining to site installation activities,
(b) Identify and coordinate with personnel participating in site preparation and installation,
(c) Provide installation personnel with access to the site,
(d) Ensure that contractor installations meet FAA standards,
(e) Inform the Technical Officer whenever technical and contractual issues are identified,
(f) Inform the Technical Officer on the status of site preparation, equipment deliveries, and installation progress,

(g) Identify power and grounding connection points, internal facility cable raceways, and buried or hidden utility conduits that would affect the installation effort, and,
(h) Assist in verification of proper performance of the PRM during site testing.

6.2 Funding Resources

Site preparation funding to include power upgrades will be provided to each region for PRM. AND-450 is responsible for the completion of PRM implementations and the contract with Allied-Signal.

AND-450 will manage all implementation funding requirements regarding the acquisition of PRM hardware and software. This implementation includes site surveys and installation plans by the contractor , all equipment/parts/supply, and training for AF and AT resources.

All five PRM systems have been procured. Installation funds are available for St. Louis, Minneapolis, New York - JFK, and Philadelphia. It is anticipated that installation funds for Atlanta will be included in the FY 2000 appropriations.

The PRM funding profile is found in Table 6.2-1

	PRIOR	FY 96	FY 97	FY 98	FY 99	FY 00	TOTAL
F&E (Current)	127.9	0.0	0.0	0.0	0.0	0.0	127.9
(Proposed)	127.9	0.0	0.0	0.0	3.3	7.3	138.5
O&M	0.0	0.0	0.177	0.580	0.281	0.201	1.239

Table 6.2-1 Funding Profile

6.3 Government Furnished Property (GFP)/Government Furnished Information (GFI)/Government Furnished Equipment (GFE) Obligations

The FAA will provide access to telephone lines, cables, cable runs, and power. The FAA will also provide site plans , electrical drawings, interface requirements documents, and other information necessary to support implementation. (Source FAA-E-2869a)

6.4 Inter-Agency Involvement

Not applicable

6.5 Site Implementation Process

6.5.1 Implementation Planning P hase

Planning throughout the PRM acquisition process will help ensure that adequate resources are available at all levels and that appropriate preparation has been completed prior to conducting site implementation activities.

Spanning the time prior to equipment installation at the four remaining PRM sites (STL, JFK, PHL, ATL) and extending into the integration and testing of new systems, there are ongoing FAA program implementation planning responsibilities. These include, but are not limited to, the following:

(a) Review and comment on this PIP and provide comments for the next revision.
(b) Participation in Field Implementation Teams (FIT) and resolution of local and regional implementation discrepancies and issues
(c) Review and comment on PRM CDRL items
(d) Attendance/participation in program reviews, design reviews and other activities which may require the insight and experience of personnel from the field
(e) Provision of escort support, especially during installation and testing activities
(f) Appointment by Regional office of site TOR, AT and AF representatives to support installation and testing at each facility
(g) Designation of key Regional AF site personnel responsible for preparation of site adaptation data
(h) Coordination of terrain map generation for each site

6.5.2 Site Preparation Phase

Site Preparation phase for PRM begins with the conduct of site surves and concludes with delivery of PRM equipment at the respective sites noted above. During the interval between these two milestones, all site preparation tasks necessary for installation of hardware including site surveys, site preparation, and hardware delivery are performed. Facilities and Equipment (F&E) activities include building preparations, storage, providing facility power, space, air-conditioning, communications access, and Government support equipment preparations. The escort support activity will be conducted within each site's specific regulatory practices. Site regulatory procedures pertaining to escort activity will be agreed upon during the site surveys and reviewed during the pre-installation kickoff meeting between Allied-Signal and associated FAA personnel. Preparation of the site adaptation parameters will also commence at this time.

Allied-Signal will perform site surveys in cooperation with the FAA lead engineer at least 90 days prior to the scheduled installation. The timing of these surveys will allow sufficient lead time for the contractor to prepare the required system cables and for the FAA to prepare the sites for the installation. During the site surveys, Allied-Signal will gather detailed site data identifying equipment placement, power, grounding, environmental, cable installation, and other considerations for PRM. Allied-Signal will also identify all site preparation work to be completed by the FAA prior to PRM equipment delivery.

The FAA TOR will assist Allied-Signal in the site surveys by:

(a) Reviewing each site survey checklist and assisting the contractor field representative in obtaining needed data
(b) Assisting in the review and preparation of the PRM Site Installation Plan (SIP), contract data requirements list (CDRL) items (Allied-Signal only). The PRM GSIP (Attachement B) should be an assist in this task.
(c) Arranging access to the installation areas with the operations personnel
(d) Providing site data including:
- Floor plans showing the cabinet and auxiliary equipment placement locations in each room (i.e., Equipment Rooms and tower cable)
- Electrical and mechanical drawings depicting: Primary power distribution; power and signal cable routing via conduit or cable trays, ducts, and supports; pull/junction boxes;
- A table listing existing primary power and air conditioning by room location

Following completion of the site surveys, Allied-Signal will prepare Installation and Check-Out Plans, fully definitizing the activities to be performed by both Allied-Signal and the FAA from equipment delivery through completion of hardware acceptance testing.

6.5.3 Installation and Check-Out Phase (INCO)

The INCO for PRM begins with the arrival of equipment at the site and concludes with completion of testing.
Allied-Signal is responsible for complete turnkey installation of the PRM system at each of the installation sites. As such, Allied-Signal is responsible for: (a) site evaluation (b) development of construction and installation plans and reports (c) site preparation and construction (d) installation of PRM equipment (e) relocation of existing equipment, if required.

Allied-Signal will provide all material, equipment, labor and services and obtain all certifications, approvals, permits, clearances, insurance, bonding, etc.,necessary for the full trunkey installation including site inspection, preparation, delivery, construction, installation, check-out testing, and site acceptance of the PRM system. Allied-Signal will provide full-time supervision and direction of its personnel and subcontractors during ail phases of the site preparation and system installation.

Shortly before INCO, Allied-Signal will conduct a site readiness review to ensure the facility interface requirements to the PRM and AIU equipment have been satisfied. Any changes or variances in interface requirements will be assigned and resolved at that time.

Allied-Signal will arrange delivery of all PRM and material, without damage or loss, to the installation site. Allied-Signal's responsibility will continue through the off-loading phase and placement of the equipment at the designated installation position. FAA personnel need not assist the Allied-Signal in this activity except to clear aisles and areas to allow for intra-facility transport of the delivered items to their destined locations within a respective site or building as

specified by the site coordinator. In addition, Allied-Signal will notify the site coordinator of shipment fifteen (15) calendar days prior to shipment. Notification is to include: planned date of shipment; contract number; description of the equipment or material and quantities; and, name(s) of carriers.

The PRM TOR is responsible for ensuring the equipment delivered to the installation site by Allied-Signal matches the Bill of Lading. The Bill of Lading will be signed -off by the QRO prior to the equipment leaving the Allied-Signal facility. The TOR will retain receipts provided by the Allied-Signal as part of the project documentation. The primary responsibility of the TOR is to monitor the work of Allied-Signal in the site preparation, equipment delivery, and installation of the PRM system on-site.

Acceptance testing will be accomplished in accordance with Allied-Signal submitted, government approved, tests plans and procedures. Acceptance testing is guided by FAA-E-2887A. Allied-Signal will allow FAA to witness any or all formal and informal tests. The objective of the acceptance testing is to ensure that the implemented PRM system, including all functional areas within and all internal and external interfaces meet the requirements of the PRM specification in its intended operational environment. Acceptance testing is considered complete upon satisfactory completion of all phases of testing in accordance with the approved Test and Evaluation Master Test Plan. The TOR will assist the test director from Allied-Signal, as required, in on-site acceptance testing and acceptance inspections.

Upon completion of on-site acceptance testing of the PRM by Allied-Signal, a CAI will be performed between Allied-Signal, AND-450, and the TOR. The requirements of a CAI are covered in more detail in the PRM TOR Handbook for each site. Once each of the requirements are successfully completed, the TOR completes FAA Form 256.

(Source: FAA-E-2887A and PRM TOR Handbook, STL)

6.5.3.1 Location of Equipment

PRM equipment is located in one of two areas: the T/R site, generally on the airport grounds, or the Ops site, located in the FAA TRACON/Equipment room. In addition, two Parrots (ground-based beacon transponders used by the PRM system to check its range and azimuth accuracies) are installed at a remote site, generally located within 1 mile from the PRM T/R site, dependent upon siting requirements.

6.5.4 System Integration Phase

The site System Integration Phase for PRM begins when Contractor Acceptance Inspection (CAI) is accomplished and concludes when the FAA declares Initial Operational Capability (IOC) for the PRM. During this phase, which is conducted by site and regional AT and AF personnel, all of the site's internal and external interfaces are established, operational procedures are evaluated, and training and familiarization occurs.

Allied-Signal will furnish and install all test jigs and any special test equipment for system checkout and sie acceptance testing in accordance with FAA-E-2887A and the PRM SOW. Allied-Signal will test each item of the PRM equipment for proper operation in accordance with FAA-E-2887A and the PRM SOW as applicable.

6.5.5 Field Familiarization Phase

The PRM site Field Familiarization Phase extends from the IOC milestone through completion of the Operational Readiness Demonstration (ORD). During this interval, the site's technical and operational work forces and management personnel employ the new equipment in a carefully controlled operational environment to verify that the fully integrated system is fully functional. Use of the new system capabilities typically begins with use for limited periods of time during low traffic time periods, gradually increasing usage for longer periods under full traffic load conditions. During this time, site personnel develop and demonstrate full proficiency in the maintenance and operation of the newly configured operational system. AOS-200 and Allied-Signal may serve in a support role.

Field familiarization will be accomplished using progressive confidence building processes. These will be defined in a separate testing; document and will include but not be limited to:

(a) AF testing and certification
(b) System functionality and load testing
0c System stress testing through various means such as track volume, radar input volume, controller entry volume, etc
(d) Validation of off-line processes by AT and AF personnel
(d) Failure mode testing (entering and exiting a degraded mode) will be completed as a coordinated effort between AT and AF

During field familiarization, standard operating procedures and training will be evaluated to ensure that they are effective and workable under the new environment. Controllers and technicians will be briefed on transitioning from one ARTS to the other, its impact on the operational environment, and the procedures to be used to mitigate software functionality issues that may arise.

6.5.6 Dual Operations Phase

This phase does not apply to the PRM.

6.5.7 Equipment Removal Phase

The PRM is not a replacement for another system. There is no refurbishment required and there will be no removal of excess equipment related to this activity.

Conditions under which any special test equipment may be removed should be addressed in the Site Implementation Plans.

7.0 STATUS ASSESSMENT

7.1 AF Operations

Staffing needs may increase to cover one AF technician position, if present staffing is near or full utilization.

7.2 AT (Air Traffic) Operations

Unless a facility already conducts simultaneous ILS approaches staffing needs will increase to cover two radar positions.

7.3 System Configuration and Engineering

The system configuration has been baselined. Future changes to the configurarion will be implemented through the NCP process. Future engineering support may be required to eliminate unforseen anomalies and site specific problems such as reflections

7.4 Physical Facilities

There are no issues at this time. Real-estate requirements for the T/R site have been planned and no problems are anticipated.

7.5 Financial Resources

All five systems have been procured. However, funding for installation is not available for Atlanta. Since the new Atlanta runway may not be completed until 2002, the current plan is to request installation funding for FY 2000, recognizing that more than 24 months" lead time is required.

7.6 Human Resource Management

There are no additional issues or risks connected with PRM at this time other than those identified in section 7.1.

7.7 Test and Evaluation

The FAA will supervise the testing leading to the JAI of all new systems. A flight check of all new systems will be performed to evaluate problems and verify the performance of system modifications.

7.8 System Support

No support issues have been reported at this time. Allied-Signal is responsible for complete turn key installation of the PRM system. Also Allied-Signal will provide interim depot level support for a period of three year, as noted in Section 2.1. An accurate assessment of the support required to maintain PRM will be recorded as this time.

7.9 Schedule

The schedule could be effected by funding. Currently all systems have been procured, however installation funds are not available for Atlanta. AND-450 is working this issue with the view of securing funding in FY 2000.

7.10 Administration

There are no issues or risks at this time.

7.11 Implementation (Requirements)

There are no further issues and risks other than those identified above.

APPENDIX A

ACRONYMS AND ABBREVIATION LIST

APPENDIX A ACRONYMS AND ABBREVIATION LIST

A

AF
Airway Facilities ..... 11.
APLNI
Associate Product Lead for NAS Implementation ..... 4.
AT
Air Traffic ..... 11.

C

CAI
Contractor Acceptance Inspection ..... 5.
CDRL
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EDDAs
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F

FIT
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GSIP
Generic Site Implementation Plan ..... 4...

H

HVAC
Heating, Ventilation & Air Conditioning ..... 4..

I

INCO
Installation and Check-Out Phase 17
IOC
Initial Operational Capability 20
IPP
Integrated Product Plan 13
ISD
In-Service Decision 24
ISS
Implementation Support Specialist 4

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NATCA
National Air Traffic Controllers Association 13
NEPA
National Environmental Policy ACT ..... 8...

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ORD
Operational Readiness Demonstration ..... 20.

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APPENDIX B
GENERIC SITE IMPLEMENTATION PLAN (GSIP)

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1. INTRODUCTION

1.1 Purpose

The PRM GSIP has been developed as a tool to assist regional and site personnel with the development of their Site Implementation Plans (SIP). The GSIP is to be used as a starting point to identify those activities required to successfully complete implementation of the project at a specific location and identify organizations responsible for the various activities. Regional and Site personnel are encouraged to tailor the GSIP to suit their specific site situations.

Tasks and resource data contained in the attached GSIP was reviewed by ACE. As noted earlier in this PIP, an RTP has not been developed for PRM. The basis for this GSIP was a comparison of like programs.

1.2 Scope

The GSIP identifies the PRM activities through the various phases of site implementation. These are consistent with the phases identified in Section 6.5 of the PIP. These phases are: Implementation Planning, Site Preparation, Installation and Check Out (INCO), System Integration, and Field Familiarization. Dual Operations and Equipment Removal are not relevant for the PRM implementation.

The PRM GSIP consists of a broad list of activities required to install a project at a facility. Facilities differ by platform and from facility to facility, therefore, certain activities may not apply and should be removed from the list. Other activities may be added to the list in order to complete the site plan. Once tailored for a particular site, the revised GSIP normally becomes the SIP for that site. When there is a contractor tasked to provide a SIP, the GSIP can be used to identify those FAA activities that need to be accomplished that may not be provided for in the contractor's SIP.
Impact data not currently included in the GSIP will be developed during the ICDLS period and will be published in a later revision to this PIP.

1.3 Responsibilities

The Associate Product Lead for NAS Implementation and the Implementation Support Specialist (APLNI/ISS) are responsible for the development and coordination of the GSIP. Soft copies of the GSIP may be obtained from the ISS.

1.4 Organization

The GSIP is organized as follows:

Number -	The item number of an activity for an implementation phase.
Activity -	Description of activity.
PIP Paragraph -	Refers to the paragraph numbers of the Program Implementation Plan (PIP) where information related to the GSIP item is located.
Responsible Org -	Refers to the organization identified as being responsible for the activity.
Duration -	Expected time period to complete the activity
Due Date	End date for completing the task
Comment	Serves to clarify one of the fields

Tasks within the GSIP identified as "N/A" indicate that there are no personnel requirements identified by the site as a result of this task.

PRM Generic Site Implementation Plan

Act. #	Activity	PIP Para	Responsible Org	Duration (Days)	Due Date	Comments
	IMPLEMENTATION PLANNING					
1	Identify the following for the region:	1.6	AND-450	1	< CA	RAPM disseminate; on-going
	Installation sites					
	Site survey dates					
	Site preparation					
	(Equipment Delivery date(s)					
	Equipment Installation date(s)					
2	Identify Regional and Site responsibilities for PRM Implementation	6.0	RAPM/ AND-450	5	90 days > CA	
3	Identify PRM Implementation Team	6.0	NASOC/ AND-450	5	90 days < site survey	
4	Coordinate advance project funding with Product Office for site prep and travel	6.2	RAPM	1	< CA	
5	Publish Site Survey Plan	6.5	NASOC/ AND-450	30	60 days < site survey	
6	Identify site survey personnel:	6.5	AND-450/ RAPM	5	< site survey	
	Site AT participant(s)					
	Site AF participant(s)					
	Site contractor support participant(s)					
	Technical On Site Representatives (TOR) & phone number					
	Safety/ HAZMAT participant					
	Regional 4XX participants					
	Regional 5XX participants					
	Regional Logistics Coordinator					
	FAA HQ participants					
7	Publish first draft of Site Implementation Plan (SIP)	6.5.1	NASOC	45	30 days < site survey	

Act. #	Activity	PIP Para	Responsible Org	Duration (Days)	Due Date	Comments
8	~~Develop a plan to track action items and issues~~	~~6.5~~	~~NASOC~~	~~1~~	~~< site survey~~	
9	~~Identify site AF support personnel budget requirements for implementation~~	~~6.2~~	~~RAPM/ NASOC~~	~~30~~	~~< site survey~~	
10	~~Develop labor estimates for PRM site preparation and travel costs~~	~~6.2~~	~~RAPM~~	~~30~~	~~site survey~~	~~Requires designation of region/ site responsibilities~~
11	~~Prepare and present implementation brief to PASS and NATCA~~	~~2.4~~	~~RAPM/ANI -XXX~~	~~30~~	~~site survey~~	
12	~~Identify unique space requirements for installation~~ ~~Equipment storage~~ ~~Staging dock area requirements~~ ~~Spares storage~~ ~~Test equipment storage~~	~~5.8~~	~~NASOC~~	~~5~~	~~site survey~~	
13	~~Identify impacts of other projects on PRM implementation~~	~~6.0~~	~~AND-450/ AUA-300~~	~~5~~	~~site survey~~	~~Identify schedules and resources~~
14	~~Determine if sufficient floor space is available for installation. If not generate~~ local NCP for an alternate location.	~~6.0~~	~~NASOC~~	~~5~~	~~site survey~~	
15	~~Identify TELCO requirements and modifications~~ ~~Admin TELCO lines~~ ~~Added TELCO line and hardware requirements~~ ~~Wire runs and closets to be used~~ ~~Lead times for service requests (TSR'S)~~ ~~Wall, ceiling and floor penetrations~~ ~~Unique drilling requirements~~ ~~TELCO funding requirements~~	~~5.11~~	~~NASOC~~	~~5~~	~~site survey~~	
16	Coordinate Maintenance Training Course Requirements with AFZ-100		RAPM	10	<Eqpmt	
17	Coordinate AT training quota requirements with ATZ-100		AXX-510/	10	<Eqpmt	

Act. #	Activity	PIP Para	Responsible Org	Duration (Days)	Due Date	Comments
			RAPM			
18	Identify local AF changes to:	2.0	NASOC/Sector	90	< IOC	AOS to provide maint. handbook
	Procedure and standards					
	Admin. and maintenance procedures					
	Operations procedures					
	Inter-facility procedures					
	System backup procedures					
	Certification Procedures					
19	Identify and update the local AT changes to:	3.0	AXX-510	90	< IOC	Requires ATP to complete National action
	Flight procedures and standards					
	Admin procedures					
20	Develop Transition Plan	6.5	NASOC	90	IOC	
21	Complete Site Assessment	6.5	NASOC	90	site survey	
	Real Property (Structures)					
	Security					
	PCB's					
	HAZMAT					
	Asbestos					
	RADON					
	Neighboring Properties, Same Parameters					
22	Determine training requirements i.e. HAZMAT, asbestos, emergency response, CPR, etc.	6.5	NASOC	5	<site survey	
23	Provide Contractor point of contact list	6.1.2				
	AF Coordinator					
	AT Site Coordinators					
	SMO & Site Coordinators for testing					
	Site Security P.O.C.					
	Site Technical On-Site Representative					
	Alternate TOR (ATOR)					
24	Review equipment layouts for:		NASOC	5	<site survey	

Act. #	Activity	PIP Para	Responsible Org	Duration (Days)	Due Date	Comments
	Tower equipment room					
	Tower CAB					
	TRACON equipment					
	Impact of delivery on operation of adjacent equipment					
	New furniture requirements					
	Minimum access requirements - front, back, side, top					
	Rack requirements and locations					
	Rack admin power requirements					
	SITE PREPARATION					
25	Conduct Initial FAA Site Survey to update site drawings and complete site survey worksheets	6.0				
26	Review updated site drawing and documents with the PRM contractor:	6.5	NASOC	5	site survey	
27	Confirm shipping address and phone number with the Program Office (AND-450)	6.5	RAPM	1	site survey	
28	Identify support space for:	5.8	NASOC	5	site survey	
	Test personnel					
	Delivery Contractor personnel					
	Staging and assembly area					
29	Determine support equipment and access requirements:	6.5	NASOC	5	site survey	
	Availability of ramps					
	Elevator sizes and capacities					
	Door openings					
	Stair well sizes					
	Staging area, ladders					
	Dollies / fork lifts					
	Trash removal / recycling					

Act. #	Activity	PIP Para	Responsible Org	Duration (Days)	Due Date	Comments
30	Review PRM power requirements:	5.4	RAPM/ ANI-XXX	5	site survey	
	Essential / Critical					
	Power panel access					
	Circuit breaker access					
	Testing procedures					
31	Identify required cabling mods:	5.3	NASOC	5	site survey	
	Convenience power outlets for contractor work					
	Wall, ceiling & floor penetrations					
	Circuit breaker panels affected					
	Unique drilling requirements					
	Grounding, bonding, and shielding requirements					
32	Determine required lighting modifications:	5.7	AND-450	5	site survey	
33	Identify PRM Contractor POC for delivery activities		AND-450	5	site survey	
	Asbestos & asbestos permits , if required					
	Dust					
	Noise					
	Storage					
	Usage					
	Disposal					
	Lock-out/ Tag-out					
	FAA HAZMAT / Environmental coordinator					
34	Coordinate with AND-450 advanced funding PA is in place	6.0	RAPM	5	RMOS <Eqpmt Del	
35	Update F&E cost estimates and schedules for PRM prep	6.2	RAPM	10	12 mos Eqpmt Del	
36	Update estimates for travel costs associated with PRM prep	6.2	RAPM	10	12 mos Eqpmt Del	
37	Develop CAI Plan	5.11/6.53	AND-450	30	<Delivery	

Act. #	Activity	PIP Para	Responsible Org	Duration (Days)	Due Date	Comments
38	Initiate Facilities Reference Data File (FRDF) for PRM		AXX-450	30	<Delivery	Coordinate w/NASOC
39	Finalize training course attendees and schedule for:	2.1	NASOC/ ARN-100	30	<Delivery	Coordinate w/
	PRM Orientation course					
	AT Operator / Supervisor					
	AF Hardware Maintenance					
	Software maintenance					
40	Delivery, storage & equipment access:	5.8	NASOC	10	4 wks. <Eqpmt Del	
	Arrange access to point of delivery					
	Arrange for equipment storage					
41	Review Contractor's Site Survey Quick Look Report	6.5.2	NASOC	30	60 days > site survey	
42	Update delivery schedule for project hardware	6.5.3				
43	Develop Site Installation Team Kickoff Agenda:	6.5	RAPM	30	60 days Eqpmt Del	Coordinate w/AF & AT
	Security passes/badges					
	Parking					
	Number and type of vehicles					
	Transfer, loading and unloading requirements					
	Contractor clearance list with SSNs etc.					
	Work day					
	In house contract list					
	Training schedule					
	Issue resolution & tracking					
	Verify contractor insurance coverage & bonding					
44	Identify any LOAs and required or needing modification	6.5	RAPM/ANI x x x	30	30 days <Eqpmt Del	<

Act. #	Activity	PIP Para	Responsible Org	Duration (Days)	Due Date	Comments
45	Review and approve Contractor site acceptance test plans and procedures (CDRLs)	6.5	NASOC	45	<Del	
46	Review FAA Test and Evaluation Master Pan (TEMP):	6.5	NASOC	45	<CAI L/C	
47	Identify testing personnel	6.5	NASOC	10	<CAI	
48	Coordinate CAI Plan with sector & site personnel	6.5	NASOC	30	<CAI	
49	Develop Field Test and Shakedown Plan	6.5	NASOC	30	<CAI	
50	Participate in previous sites' Installation and Checkout and Field Shakedown	6.5	RAPM	30	<CAI	
	INSTALLATION AND CHECK-OUT					
51	Establish the JAI Board (JAB)	6.5.2		5	<ORD	
52	Update cost estimate for AF and AT personnel providing project specific support	6.5.2	RAPM	5	on-going	
53	Oversee hardware delivery in "Stand Alone" configuration		ANI-XXX	30	Delivery	
54	AT Instructor Cadre training by Contractor	6.5.2	AFR-100	5	60 days <CAI	
55	Develop AT training schedule and lesson plans	6.5.2	AFR-100	10	CAI	
56	Update AF system certification procedures		AOS-300	30	CAI	
57	Conduct the CAI	6.5.2	AND-450	5	CAI	
58	Update AF personnel certifications for new equipment	6.5.2	sector	10	<IOC	
59	Update facility maintenance operating procedures for project hardware	6.5.2	sector	10	<IOC	
			AXX-450	45	IOC	
60	Complete facility electronic site preparation	6.5.2				
62	Finalize FRDF	6.5.2	AXX-450	30		
	SYSTEM INTEGRATION PHASE					

Act. #	Activity	PIP Para	Responsible Org	Duration (Days)	Due Date	Comments
63	Update cost estimate for AF and AT personnel providing project specific support	6.5.3	RAPM	5	on-going	
64	Complete AF training	6.5.3	RAPM	90	<IOC	
65	Complete AT training	6.5.3	AXX-510/ AFR-100	45	<IOC	
66	Review AF/AT operational procedures	6.5.3	NASOC	30	IOC	
67	Close out any outstanding CAI discrepancies	6.5.3	NASOC	90	IOC	
68	Conduct operational testing	6.5.3	sector/AT	90	IOC	
69	Monitor system integration testing	6.5.3				
70	Conduct AF familiarization training	6.5.3	AOS/AND/ ACT	90	IOC	
71	Conduct partial JAI	6.5.3	sector	1	IOC	
72	Declare IOC	6.5.3	sector	1	IOC	
73	Prepare final testing report	6.5.3	NASOC	10	90 days IOC	
	FIELD FAMILIARIZATION PHASE					
74	Review funding requirements to complete Field Familiarization Phase tasks	6.5.4	RAPM	5	on-going	
75	Identify funding requirements to complete Dual OPS and Equip Removal Phase tasks.	6.5.4	RAPM	5	6 mos<ORD	
76	Validate operational procedures	6.5.4	SMO	90	ORD	
77	Monitor systems Shakedown	6.5.4	AOS/AND-450/AT	90	ORD	
78	Conduct Joint Acceptance Inspection (JAI) using the JAI checklist	6.5.4				

Act. #	Activity	PIP Para	Responsible Org	Duration (Days)	Due Date	Comments
79	Conduct Commissioning procedures	6.5.4	SMO	1	ORD	
80	Monitor and report on system performance	6.5.4	SMO	90	on-going	

APPENDIX C
DEFINITION OF TERMS

APPENDIX C DEFINITION OF TERMS

The following are definitions of terms to assist in reading this plan. Acronyms are defined in Appendix B.

- Acquisition Phase: The period of time before or following a Joint Resources Council (JRC) investment decision, or other major life cycle acquisition milestone (e.g., contract award, OT&E , etc.).

- Associate Product Lead for NAS Implementation (APLNI): An FAA member of an Integrated Product Team (IPT) ASSIGNED by the NAS Transition and Integration Division (ANS-700) to plan and coordinate product implementation, help resolve implementation/transition issues, and to serve as an information bridge between Headquarters, Region, and field activities.
- Implementation Support Specialist (ISS): A NAS Implementation Support Contract (NISC) person assigned by ANS-700 as a member of a Product Teams (s) to plan and coordinate product implementation, and serve as an information bridge between Headquarters, Region, and field activities.

- Airway Support Facility: The combined physical structure, equipment, support systems, and functions which operate as a distinctive single entity to directly support the National Air Space (NAS) but not otherwise within the En Route or the Terminal Facilities programs.

- Implementation: Those activities necessary to deploy and support the products of a single program in a facility. Implementation activities during the system/equipment acquisition have been divided into 7 phases and tied to key decision points incorporated in the Regional Tracking Program (RTP) activity networks. These phases are:

  Implementation Planning: The Planning phase spans the time prior to equipment installation, through the identification of issues and concludes with integration and testing at the site.

  Site Preparation: Begins with site surveys, includes site preparation activities and concludes with the arrival of equipment at the site.

  Installation and Checkout (INCO): This phase begins with the arrival of the equipment at the site, includes site acceptance testing and concludes with the completion of testing.

  System Integration: The Systems Integration phase begins when CAI is accomplished and concludes when the FAA declares Initial Operating Capability (IOC) for the system. During this phase, all FAA internal and external interfaces are established.

Field Familiarization: The Field Familiarization phase extends from the IOC milestone through completion of the Operation Readiness Demonstration (ORD). During this interval, the technical and operational work forces and management personnel employ the new equipment in a carefully controlled operational environment to verify that the fully integrated system is performing within specified parameters. Use of the new system capabilities typically begins with use for limited periods of time during full traffic load conditions. During this time, site personnel develop full proficiency in the maintenance and operation of the newly configured operational system.

Dual Operations and Equipment Removal that constitute the remainder of the 7 phases does not apply to the implementation of the PRM.

- Issue: An issue can be defined as minor or national. A minor issue is a problem that is site specific and not of national significance. A national issue will stop a program/product's progress toward implementation.

- Operations and Maintenance (OM&N): The Operations and Maintenance phase of the acquisition process begins upon completion of the JAI and continues beyond implementation for the remainder of the system's life cycle. The Operations and Maintenance phase marks the achievement of full operational capability.

- Personnel Certification: Personnel certification is a two-phase process consisting of a certification authority phase and a responsibility assignment phase. Certification authority requires FAA airway transportation system specialists to demonstrate knowledge of the theory of operations and the ability to practically demonstrate this knowledge. Certification responsibility is the official assignment to FAA airway transportation system specialists to use their authority to certify a specific service, system, subsystem, or equipment in the NAS.

- Platform: A colloquial reference to a basic type of NAS facility that hosts the systems and subsystems necessary to perform an essential air traffic control function.

- Risk: A concern that there might be an issue, but there is insufficient data to confirm the issue.

- System Certification: Periodic verification and validation that the advertised quality and scope of services, and the capability of providing those services, are being provided to the users.

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